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ROCKS and MINERALS

A Magazine for Mineralogist, Geologist and Collector . . .

. . . . . *Official Journal of The Rocks and Minerals Association*

JULY, 1938

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THE ROCKS AND MINERALS ASSOCIATION

PEEKSKILL, N. Y.

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Organized in 1928 for the increase and dissemination of mineralogic knowledge.

To stimulate public interest in geology and mineralogy and to endeavor to have courses in these subjects introduced in the curricula of the public school systems; to revive a general interest in minerals and mineral collecting; to instruct beginners as to how a collection can be made and cared for; to keep an accurate and permanent record of all mineral localities and minerals found there and to print same for distribution; to encourage the search for new minerals that have not yet been discovered; and to endeavor to secure the practical conservation of mineral localities and unusual rock formations.

Ever since its foundation in 1928, the Rocks and Minerals Association has done much to promote the interest in mineralogy. It has sponsored outings, expeditions, formations of mineralogical clubs and the printing of many articles that have been a distinct contribution to mineralogy.

Those of our readers who are members of the Association can rightly feel that they too were sponsors of these many achievements that have helped to give mineralogy a national recognition. Among your friends there must be many who would like to have a part in the Association's work—to share with you the personal satisfaction, the pleasure, and the benefits of membership. Will you give your friends this opportunity to join the Association by nominating them for membership? A nomination blank will be found elsewhere in this issue.

Each new member helps to extend the Association's activities—helps to make your magazine larger,better, and more interesting, and above all assists in the dissemination of mineralogical knowledge.

Some advantages of membership: All members in good standing receive:

(1) **Rocks and Minerals,** a monthly magazine. (2) A member's identification card that secures the privileges of many mines, quarries, clubs, societies, museums, libraries. (3) The right to participate in outings and meetings arranged by the Association. (4) The right to display a certificate of membership and to place after their names a designation indicating their membership or to advertise membership on stationary, etc. (5) The distinction and the endorsement which comes from membership in the world's largest mineralogical society.

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Queens Mineral Society, Miss Bernadette Reis, Sec., 10314-97th Ave., Ozone Park, L.I., N.Y.

ROCKS and MINERALS

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Edited and Published by PETER ZODAC

JULY 1938

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ROCKS and MINERALS PEEKSKILL, N. Y., U. S. A.

The Official Journal of the Rocks and Minerals Association

CHIPS FROM THE QUARRY

PETER ZODAC

From The Four Corners of The Earth

ROCKS and MINERALS Brings You Timely Articles Of Much Value and Interest.

This is made possible because of the enviable reputation that the magazine enjoys and furthermore because it circulates among the most progressive men and women in the mineralogical world—men and women who are heartily in accord with the purposes of both the magazine and the Association. Therefore, whenever any of our members makes a scientific discovery, or an outstanding find, or visits some remote section of the world, it is ROCKS and MINERALS who is given the special privilege to announce or print items that are of great interest to the mineralogical world. And the articles in general—many are masterpieces.

In the February, 1938, issue for example, ROCKS and MINERALS printed four pages in fluorescent ink, the first time in the world's history that this has been done.

In this issue, we announce the arrival of the largest and finest optical quartz crystal ever to enter the United States. We feature an intensely interesting article on mineral collecting in the Swiss Alps. We are also privileged to print an unusually valuable article on the geology and physiography of the most northern tip of the North American Continent. In this latter article, Mr. Downes, its author, tells us that the region around Boothia Peninsula, is barren, forbidding and uninhabited and that it has not been visited by white man since 1859 until his party visited it last summer. Furthermore, three good pictures which illustrate the article are the first ever taken of that inhospitable land and the two maps are the most complete ever made of the area. This article alone should be of tremendous interest to all our readers.

Read these three articles and tell your friends about them—let them read the articles also and induce them to join the Association. Tell them further that every number of ROCKS and MINERALS is at once a very fascinating issue for the entire family, from grandfather to school child, and a permanent reference for serious students of mineralogy. That to teachers as to parent, it affords a valuable background for reference. It makes the earth smaller and the individual's world larger, richer, and more fascinating.

Peter Zodac

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VOL. 13, NO. 7

The Official Journal of the ROCKS and MINERALS ASSOCIATION

WHOLE NO. 84

PROFESSIONAL MINERAL COLLECTING IN TAVETSCH (Near St. Gotthard), SWITZERLAND

Original Paper (PART 2) Written In German By STRAHLER J. HITZ
Tavetsch, Ct. Grison, Switzerland.

Introduction and Translation by Dr. J. G. SCHUDEL
Hasbrouck Heights, New Jersey

Part 1. Introduction

I have been a collector of minerals for a number of years. Some of the specimens I found myself, the nicer ones, however, were purchased from dealers. I believe most collections grow this way. In the beginning one is satisfied with almost any chip. As the hobby expands, the desire for quality becomes dominant. The best pieces are usually those that are supplied by the dealer.

I often have wondered how professional dealers located the many beautiful, perfect specimens they offered when I had such difficulties in finding material which rarely compared with even their second choice stock. The often heard statement that their specimens came from countries where the supply is plentiful, did not satisfy me. I was particularly amazed to see exhibits of unusually beautiful Swiss minerals in museums and at mineral sales. From my own experience, I had learned that such specimens cannot be had for the taking, for we seldom found crystals even of an inferior grade. This is why the usual explanation did not satisfy me. While attending a mineral sale I usually picked up a specimen, looked at the price tag, and hesitatingly set it down again. I handled other ones. Finally I could resist no longer. I bought a few and ever since regretted that I passed up the others, for I had believed that some day I should find similar ones without the help of a dealer. Mrs. Schudel and one of the children spent the Summer of 1936 in Europe. Upon their return they brought me a Smoky Quartz from Switzerland. The specimen, I thus obtained, is an exceptional beauty. It is a group of almost perfect dark crystals, about 6" x 6" on the base, towered by a thick large crystal in the background. The Quartz is free from the customary Chlorite coating which so often spoils the appearance of Swiss Smoky Quartz by ruining the sparkling gloss of the faces.

My pleasure was immense when I received the present. I was so amazed that I communicated with the party who had found and sold the specimen to my folks. I wanted to know where it came from, how it was found, etc. I soon learned from the correspondence that Smoky Quartz is only found at certain heights in the Gotthard region. Quartz is colorless below 8,300 feet above sea level! The minerals are rarely found by free access; in most cases they have to be blasted cut of the rock. This explains why the casual traveler is not able to find equally good material himself. The efforts and dangers, mentioned below,

explain the reason why a perfect group still fetches a good price. The localities of the finds are not easily accessable, but only under physical hardships, so different from our easy car-rides to a quarry where we tip a foreman.

A year ago I took a notion of making a number of photographs of some specimens from my collection and sent copies of them to Mr. Zodac. He liked the pictures and suggested that I should write something about Smoky Quartz for ROCKS and MINERALS. I did not think I had enough material for it at that time, but approached "Strahler" Hitz in Rueras (Tavetsch), Switzerland, with the problem. In turn I received from him an extensive letter and a selection of his professional diary. The second part of this paper is a translation of some of the information thus received. From it, I obtained the answer I was looking for everytime I had attended a mineral sale.

Last summer I had a chance to go to Switzerland on business. My stay over there lasted only 12 days, of which I had to devote 6 days to my professional duties. The balance of my stay was spent in seeing relations and friends. However, in spite of the limited time, I managed to spend 2½ days with an old friend of mine in the mountainous section, adjoining St. Gotthard. The 65 year old "Strahler" Hitz who had corresponded with me before, was our host and guide. He still climbed the mountains like a chamois. Though I am 22 years younger, he was forced at regular intervals to wait for me in order that I could catch up with him.

The early time of the season did not permit any worth-while prospecting. Snow still covered the famous localities in July. But at that I do not regret the trip. The specimens I bought there mean now so much more to me since I saw the sinewy man who brought them to light. I know now the rocks and ledges where the minerals come from and they still recall memories of the gorgeous climb, as well as of the flowers, birds, and animals we saw.

I watched my treasure that nothing should happen to it on the trip back to the States. I carried the load myself when changing trains in Switzerland and France and while boarding the ship. Everything went well as far as New York. Here two customs officers (one of whom was said to be a specialist) questioned me for 35 minutes, insisting that the regular faces of the crystals were artificially ground and polished, and therefore not duty free. I argued that they should go to the American Museum of Natural History in New York to check up on my statements and call me back, if they were not satisfied with my declaration. Nothing helped until the largest specimen, a white Quartz group, fell down and broke to a useless heap. After this they gave in. I mention this in the hope that the reader will be spared a similar experience, or may use it as a procedence, if he should run into similar trouble.

Part 2

By "STRAHLER"* J. HITZ

At the foot of Mount Badus (also called Six Madun), northeast of the St. Gotthard massive in Switzerland, is the source of the river Rhine, a place visited by thousands of tourists every year. Here live the strong and healthy people of the Valley of Tavetsch[1]. The inhabited section is 4,600 feet above sea level. Farming is a hard job here, on the slopes of mountains of which all are over 10,000 feet high. Usually deep snow covers the valley until the beginning of June, and the harvest has to be completed by the middle of October, in order to snatch it from the approaching winter. The chances for making a living from farming and

* Strahler is a German word meaning a professional mineral collector in the Alps.

[1] The native tongue of these people is Romansh, a derivative from Latin, like the French, Italian, and Spanish. At one time this language was spoken over a great part of what is known as Switzerland today. This tongue was driven back by the Germanic people who penetrated from the north. Romansh is found only in small remnants today in the mountains of the Canton Grison, used by about 50,000 inhabitants. By popular vote, the Swiss recently declared Romansh their fourth legal language, to avoid it being called an Italian dialect.

Many people in this section, speak or understand German also, from the service in the army, into which every able-bodied male is drafted.

dairying are meagre. Nor is every man lucky enough to own fields suitable for raising crops sufficiently large to feed his family. He is therefore forced to find an additional source of income, or leave home for the industrial sections in the valleys below, away from his dearly beloved mountains, no longer a free man, to his way of thinking. Mineral collecting as a profession is a side line open in this section.

As a small boy, while tending the goats up in the mountains, the author ran across fragments of Smoky Quartz crystals that had fallen from the cliffs above on the green pastures. Curious and wide eyed, he picked up the treasures and wondered where their mirror-like faces might have come from. He had seen people buy such things down along the young Rhine and he remembered an old "Strahler", who passed him up here occasionally with a sack, so heavy that the leather straps seemed to cut into his shoulders. The boy wondered: would he be able to get at such treasures?

Cautiously he tried from then on to get some information from the old "Strahler", and thus obtained a few general hints, and clues from the old man. Full of enthusiasm, the boy became determined to bring hidden treasures to the light of day.

With his few coins he ordered a steel pick, a crow bar, hammers and chisel from the local blacksmith. He packed an old army knapsack with these, and with wrapping material for the minerals. He added a cooking apparatus, pipe and tobacco. In a red handkerchief he carried dry bread, bacon and goat cheese. A youthful figure, full of determination, he left his home quietly at 4 A.M., late in May, 1895, and walked with courageous steps, full of hope, to Val[1] Cavradi near Mt. Badus. This locality is known for Hematite crystals (Eisenrosen) with Rutile. Nice Quartz groups, Tourmaline, Quartz (left and right twins), Aragonite and other minerals are also found here. Arriving at the place, the new "Strahler" noticed many old workings and considered he had been born too late for some of the prospecting holes were centuries old, others may possibly have been worked by prehistoric men.

The 270 foot high cliffs, opposite to Cavradi, also showed signs of worked caves.[2] A descent on a strong rope is required to reach the workings. While studying an old cave, he examined the bottom of the opening, the rock above it, the soft dikes that enclosed the rock above the visible hole, and how they usually are inclined. Nervously he searched through rocks, walls and ledges for a suitable spot to begin his operations.

A small earth slide below a rock-ledge attracted his attention. Free from grass and soil, a horizontal crack and some Quartz veins showed their presence! Signs of a cave were close at hand. Hammer and chisels were taken from the knapsack. At the start, the rock was very hard, then somewhat loose and decomposed. Suddenly, the chisel took a leap. Precaution was needed now! Through a small opening he could see Quartz and something blue-black between the crystals. He tried to enlarge the opening as much as possible. Perspiration ran from his forehead. Noon came, the sun was burning and he was getting hungry. His simple meal tasted good from the stone table. Frequently, during his lunch, he watched the cave, his eyes hugged the Quartz with the nice Hematite crystal groups that grew from the top into the opening. Refreshed from his meal he tried to loosen his treasure; to do this without damage seemed impossible. The old man of the trade had not given him any advice on how to break the minerals out of the rock; all he had pointed out were the difficulties in locating a find and the bother to sell it. No wonder that after a few hammer-blows a crystal was falling out. Further nervous blows loosened up other crystals, and the treasure fell to pieces. The young, inexperienced prospector ruined the beautiful creation. His blows were directed too close to the crystals. The potential value of his first find thus shriveled to one quarter of the anticipated amount, but he obtained some experience and finished

[1] Val means valley in English.

[2] A more appropriate word is pocket.

the rest of the cave with a little better luck. As usual in Val Cavradi, the cavity was not large. It was about 1'-2" long, 8½" wide and 7" high. It was no wonder that the inexperienced beginner ruined his first strike. The seasoned professional collectors are usually quiet, slow, reliable people.

In his daily routine, the "Strahler" exposes himself to dangers of all sorts. He has to climb up to the rocks, ledges, glaciers, and gorges through loose stones. For the experienced and cautious one there is really only one actually serious danger, falling stones! The place where glacier cracks occur are usually known to him, even when the openings are covered and hidden under a thin blanket of snow. He knows the weather and avoids such places when he senses any danger. Such a place may be crossed safely at night and during the cold early morning hours but it may become a death trap by noon, when the snow gets soft. No one is available to help the unlucky one if he should fall through. As a whole, the number of acidents is not very large. Year after year about 5 to 6 men go on a mineral hunt in the valley of Tavetsch, but the author can't remember any serious accident. At 22 years of age, he started this profession. With pleasure and energy he has completed his 66th year of age, still prospecting. In his younger years he was known as a fairly daring man, but always cautious. Once he fell into a glacier crack, even though he had thought that he had avoided it, but was able to brace himself and climb out. Such cracks are seldom wide or plainly visible. When wide open, they become snowed in again; they re-melt and break open from below, gradually, by the strain of the downward flow of the ice, and are widened by the surface water running through small channels from above. Finally they remain covered only with a thin sheet of snow, treacherously hidden to the inexperienced, particularly in fog and darkness.

The dangers, to which the "Strahler" exposes himself are great, greater however is his pleasure. He believes himself to be the master of the mountain chain which proudly surrounds his home. Not only the high mountain peaks, the mighty rock-walls, but also the flowers, especially pretty up there between the green moss and in the clear air, seem beautiful to his eyes. Then the shiny minerals, in all shapes and colors which he brings to light with hardship and caution, produce in him a surprising pleasure! It is hard to describe the exaltation he feels in front of a just opened, pretty, clean cave, particularly in Val Giuf, and Val Cavradi. It is not the greedy pleasure of money, but reverence for the beautiful creation of nature that stirs him so deeply.

The professional "Strahler" does not depend on his good luck alone for his finds. He observes and judges everything quickly. No veins, cracks, bends in the rocks escape his eyes, nor any local slide. He prefers to go to certain places known by experience in this section for bearing minerals. The "Strahler" profession requires strength, courage and perseverance, quietness and common sense. After the few hints which he obtained from the old prospector, the novice had to learn most of it in time by his own practical experience. He does not acquire any scientific knowledge however, as a rule.

The size of the cavities, and their abundance, varies considerably in Tavetsch. A cave 13 feet long 1'-8" high and 3'-3" wide belongs to the largest ones in this section. Most of the holes are much smaller. In Val Giuf and Val Cavradi are places where several caves may be found only 3 feet apart. Of course, the minerals once removed, do not grow any more, like the flowers in the field, but a rock wall, loosened during the winter, tumbles to the valley below and may open an access to a new find. The "Strahler" chooses his trips with preference to the East of Tavetsch to places known to be heavily mineralized, as to Val Giuf (Smoky Quartz, Adularia, Milarite, Stilbite, Iceland Spar, etc., occur here.) or Val Cavradi or Val Nalps (where Titanite, Albite, Tourmaline Quartz, Heulandite, Scolazite, Chabasite, Anhydrite, Stilbite, Epidote are to be found.) With a climb of 3 to 5 hours

to the place, (a level difference of 3,000 to 5,300 feet) the overenthusiasm is dampened with a load of 45 to 65 pounds on your back.

To go to high places, he dares only on nice, clear days; but it may happen that he starts on a clear morning and gets up to 9,000 feet above sea level, when the weather may suddenly change. It may snow and a biting north wind may come over the top. It suddenly gets dark, wet and cold. But without hesitation, the daring prospector has to work his find, while the weather does as it pleases. For a long time he does not notice the cold when he packs his beautiful Smoky Quartz groups, set on green Amianthus and snow-white Feldspar. He has to yell loud from pleasure. The loaded sack may weigh up to 65 or even 90 pounds when he finally gets up with it. The leather straps hurt him. He is tired from long stooping over while hammering and chiseling, but he returns with a smile on his face, full of happiness. His thoughts are with the contents of his knapsack. During the stormy weather he had no time to admire the specimens as much as he would have liked to. In nice weather, each piece is turned around and around, admired and appraised.

Chisel, hoe, hammer, and pick often do not suffice to make a complete job to get at a cave; dynamite is then resorted to.. Two men, with 2-3 sharp drills and a heavy hammer go to the workings in such a case. Soon the rock above the cave seems to tremble under the well aimed blows of the heavy hammer. The drilling cannot be directed so that the shot will have its full effect on the cave; the specimens would be ruined in such a case. A good shot is one which removes encugh rock to permit the enlarging of the opening with chisel and hammer in the softer stone around the cave. A large cave with many minerals may take several days for emptying and for carrying the specimens down the valley. Some caves (over 9,000 feet above sea level), as for instance in the Kalkspatlucke in Val Giuf, are filled with ice. In order to get the minerals out of such a hole it is necessary to melt the ice with a wood fire. In this case the "Strahler" has the added burden of carrying the fuel up to the place, since this height is naturally above the timber line.

Forty years ago he had to return 15 times to the timber line for loads of wood for a cave at the Kalkspatlucke in Val Giuf. The crevice was filled with solid ice for a length of 10 feet, 5 feet further the ice gradually tapered off. Some of the crystals were at the ceiling, some were imbedded in the midst of the ice, some were on the cave floor. The cave was 16½ feet long, 3⅛ feet wide, and 1½ feet high.
The heat often causes many undesirable cracks in the crystals. A fire too large and burning over too long a period could easily cause the collapse of the roof of the cave, and thereby bring serious injury to the man stretched out in the narrow working place.

Occasionally the prospector is visited up here. Passing tourists from Piz Giuf and Crispalt make a detour on the way down if they notice him working. Their pleasure in viewing a group of Smoky Quartz is not less than his, and they are proud to be permitted to pick for themselves souvenirs among the left-overs of the workings.

The experienced "Strahler" is steadily on the look-out for new finds in places that have not yet been searched, especially where no one before had dared to go. Such places are usually located and thoroughly investigated with binoculers. On a nice morning two reliable prospectors hasten as partners to the predetermined rock-wall. They arrange once more for their code of signals and other important things. On a long rod of steel, driven into the ground, is fastened the middle section of a rope. One end of this rope is attached to the chest of the climber the other length is thrown over the ledge of the rock to watch whether it will reach the desired place. The climber then works himself down on the hanging rope, slowly, steadily on the watch for falling stones and such ones that are loose and may fall upon his head later on. The opening of such a cave is usually easy.

The specimens are carefully packed into his leather knapsack, fastened to the end of the rope. Then the climb back is started. It is difficult and slow. The knapsack remains at the lower end of the rope, and is pulled up afterwards, the treasures unpacked again and admired by both men.

The right to a cave belongs to the one who found and opened it. No one else has the right to remove minerals from a cave marked with tools lying in it! This is an unwritten code of the mountains, and it is not recalled that it ever was broken in Tavetsch.

The "Strahler" is not only a collector, he also has to be a dealer in minerals. The proper appraisal is often not an easy matter.

The "Strahler" profession is a steady wrestling with nature. This makes a man hard, but it does not lower, nor weaken him. Even as an old man, unable to leave his easy chair, his thoughts are still up in the heights. While dreaming over his old diaries, new life seems to return to the old limbs and he prays for the protection of the prospectors that expose themselves to the dangers of the mountains.

The following is a section of my diary taken at random. It describes the work of the year, 1936.

May 27. **Val Cavradi.** Worked on "Cugn Graischel" (Romansh for narrow wedge) in last year's cave. A nice Quartz crystal, two Adularia and some Tourmaline could be salvaged yet. Little avalanche-snow left as a passage over the creek. From a shady corner, to the right above me, dropped a huge block of ice into the depth below. Protected places are still frozen.

May 30. **Val Cavradi.** Worked in the Jert, at the middle rock, but without results. Rain in the afternoon. An overhanging ledge, to the left of me, gave me protection for a few hours. On the way home I noticed a new rock-wall that had become loose above Preit Aulta (meaning high cliff). It showed signs of a near-by pocket. I reached home drenched and with torn clothes.

June 4. **Val Cavradi.** With difficulties I finally succeeded in tilting the loosened rock-wall above Preit Aulta. The collapse of the wall caused some damage to the minerals. Two Hematite groups (Eisenglanz), rich in Rutile, three Adularia and a few Calcite crystals were the yield. Cloudy, but no rain.

June 9. **Val Cavradi.** Under the Grep dil tsches (in English meaning eagle nest rock) I widened an old pocket. From a side cave I obtained six Quartz twins and some Rutile, but no Hematite groups. High above me circled an eagle. The day was fair.

June 15. **Val Cavradi.** Blasted jointly with my son. The day was hot. The charge worked well, but the cavity could not be exposed and may yet require several additional days.

June 16. **Val Cavradi in the Jert.** More hand drilling and blasting with my son. Near evening, signs were visible of the approach to the pocket. The sky was cloudy, but calm.

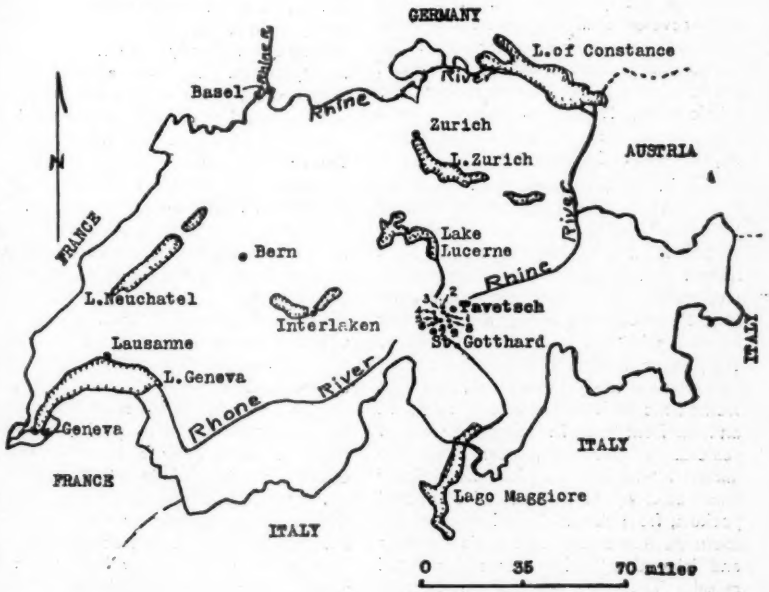
June 19. **Val Cavradi.** Father and son working in the Jert again. The cave floor became visible and the rock started to become loose above it. Hammer and crowbar made good head way. It was noon when the cave door fell open. With a yell of joy we brought out a marvelous specimen of Hematite crystals. The hat of my son nearly fell into the water during the joyful excitement. There was little besides this Hematite in the cavity, but the value of the group ought to be high. We returned home after a long rest and chat, pleased with the result of the day.

June 22. **Val Cavradi.** I turned my steps toward the Jert, in order to inspect once more the cavity of June 17. The sun shone into it from the outside and the void stared out from the inside. Resting on a rock I calmly searched the neighboring stone-walls. Old pockets that I had opened in times gone by, were visible, but no signs of a nearby pocket. The Creator has fixed the treasures of the mountains in such a manner that the supply will also last for the future, to give new pleasure to mankind. Taken in by this thought, I returned to my folks, resolved to try my luck in a new locality, the next mineral-day.

June 25. **Val Nalps.** After a walk of 5 hours I arrived at the Mutta nera (meaning black cliff). To the south-west of it I noticed an almost opened pocket, without any tools around. The day was marvelous. After a short rest, I enlarged the hole and Prehnite, Albite and Tourmaline came to the light. Cautiously I removed and inspected them. Aragonite, Stilbite and Heulandite were also present, but only sparingly. The groups were perfect and could be removed without any effort. About 30 specimens rested near the knapsack, and then, the sack carried everything willingly, but how about my back? Noon came, time for lunch. The neighborhood was without water, but there still was some snow with which to quench my thirst. I left the place after depositing my tools near the cavity. I reached my home by 9 P.M.

June 27. **Val Nalps.** At the above mentioned mineralized pocket. The yield of this day was not less than the one of two days ago. I lifted several nice Stilbites from the sand of the cavity. I started for home at 2 P.M. Mutta nera adio, you were a good prospecting place!

July 3. **Tgom, Surpalix** (meaning above the swamps). It took a two hour climb through Val Stretga (Romansh for narrow valley) where Rhododendrons and Alnus-shrubs are found, but few rocks. I stopped near an earth slide and removed the soil around a boulder. Quartz veins became visible. I broke open a small pocket, filled with Quartz crystals, but it was devoid of Rutile and Turnerite. The sun burned like a blaze. After eating lunch or better said after drinking lunch, I tried to work on a few protruding rocks, but without sucess. The hat decorated



LEGEND.

1. Rueras, near Tavetsch, home of "Strahler" J. Hitz.
2. Mittelplatten, Val Milar, three little lakes.
3. Val Milar.
4. Val Giuf; also Piz Giuf.
5. Crispalt.
6. Val Maighels.
7. Val Cavradi.
8. Tgom.
9. Val Nalps.

with Rhododendrons, but with an empty sack, I returned home, musing: To hunt for minerals is difficult in a place where you can't see any stones.

July 6. **Mittelplatten, Val Milar.** Near the little lakes. Here were a few opened pits, probably worked 50 to 60 years ago by earlier prospectors. I searched over the loose stones with my magnifying glass. Traces of Chabazite, Heulandite, Scolazite, Stilbite and Anhydrite could be found. I moved a wall with my pick-ax and crow-bar and the approach to a new mineralized vein became visible. Opening it proved to be an easy task. Nice specimens of Chabazite, Heulandite and Scolazite were present, and traces of Stilbite and Anhydrite. The Quartz crystals were of a light brown shade. The pocket was not large but the find of high value. I was done with my packing by noon when I moved to a higher level for my lunch. What a pretty wilderness! The small moss-covered rock-ledges and the three blue lakelets, enclosed in small rock-plateaus looked wnderful and I imagined I was resting on the nicest spot of the whole earth. The weather was fine and I recorded the date as one of the finest days for mineral prospecting.

July 7. **Mittelplatten,** near the three small lakes. After cleaning my find of yesterday and appraising its value, I longed for the Mittelplatten again. All night I dreamed about nice Chabazite and Heulandite, then again about the little blue lakes and the mossy rocks. I left early in the morning. On the way I stopped at the stone-hut in the Milar valley where the young-cattle-herder refreshed me with a bowl of raw milk. In an hour from there I reached the place of yesterday's new find, near the little lakes. I had left the place hesitatingly only yesterday as I suspected additional pockets, from visible signs. I chose a spot about 60 feet below yesterday's workings and labored with hammer and pointed chisel. The rock started to become brittle. After two hours of heavy work, hunger and thirst tormented me. If I only could have placed an order for a meal, but a self-prepared lunch tastes good, too. I quenched the hunger first, then drank two cups of coffee whereupon I was in good humor again, and back to the work in the tunnel. Carefully I enlarged the opening and almost the same minerals came out I had found yesterday, less Chabazite and Anhydrite this time, but more Quartz in good yield. Down in the valley the hay-making will start and I am supposed to help out with it tomorrow.

August 6. **Val Giuf.** There were some places which I suspected to be mineral bearing last year but which at that time I was unable to work. I had sprinkled them with earth and rocks in order to speed up the melting of the snow. The first and second row of rock-ledges was still buried. To the left of the first one and the Mutta dadens (meaning the ledge behind) was much less snow and prospecting expected possibly within two weeks. A large avalanche had at one time removed a great quantity of snow to the valley below. A large cave in Mutta dadens could already be seen. Also in the Kalkspatlucke (my beloved prospecting place) some caves were snow-free. My work done, I went toward the herders' cabins, mostly by way of avalanche snow. The day was fine.

August 14. **Val Maighels.** Hammering Garnets. The Garnets, found in the local rock, are easy to get. They are not found in caves; they are inbedded in the surface rock, in places where a white blue Quartz-vein cuts through the stone. Splitting the stone is easy. I returned with 23 Garnet groups in my knapsack, after a last greeting to the young river Rhine. The innkeeper in Tschamut jokingly pointed up to the mountain peaks, telling me that the supply of stones was plentiful yet. They are certainly big enough, all right! Adio, nice place.

August 20. **Val Giuf.** At Mutta dadens. I left Rueras at 4 A.M. under a cloudless sky. The cattle herders in the Giuf dairy were still asleep when I passed their place. I climbed to the 7,000 feet level where I rested for a while. Soon the longed for rock-ledges were reached. The place, recorded in my notes in 1935, was almost free from snow by now. I rested again. Hammer

and pointed chisel had little effect on the hard stone, drills will be needed. Having returned to the first rock ledge I noticed to the left of it a partly frozen new opening, from which I was able to extract a few specimens. A cold west wind blew over the mountain chain.

August 21. **Val Giuf.** Mutta dadens. A nice day. After a 3½ hours climb I reached the place, alternately carrying my drills on one and then on the other shoulder. The pure, cold air cooled my hot forehead while I rested from the strenuous march. I worked with the drill in the left hand and hammer in the right for a full two hours in order to get a 14" deep shot hole. I charged it with dynamite, attached cap and fuse and lit the latter. Bang! The shot echoed repeatedly from all sides, but it did not do what I had desired. Another hole will be needed. I returned with my job incomplete.

August 22. **Val Giuf.** Mutta dadens. Back to the old teasing place which I reached after my long climb again. I rested and ate a short second breakfast. Piz Giuf started to get enveloped in black, low hanging clouds, but I kept on working. In an hour the next shot opened my Sesame, but then rain set in. I could not mind it. The first few specimens were partly spoiled with a Chlorite coating, but then followed nice beautifully clear ones with right and left twin groups. The last three groups consisted of priceless Smoky Quartz and some Feldspar and Apatite. I wrapped everything carefully, hid the working with a pile of stone and started downward. The wet load stuck to my back. I reached my home by 4 P.M.

August 26. Back to the above find. Rain water had seeped into the pocket. The crystal groups were partly submerged in the pool. I emptied the cave with my skillet. A beautiful creation then came to the light! I knocked my head repeatedly on the ceiling of the cave, so overjoyed was I, but it did no harm to the rock. Eight crystal groups, 4 twinnings and some single crystals made

A SCENE IN THE SWISS PIZ NER ALPS.
In background, extreme left, is Piz Ner; extreme right is Piz Giuf.
(Piz means mountain peak)

a new load for tired legs. The day was fair.

August 27, 28, 29. During these days I was accompanied by my son, Joseph, to finish the same find. Each day meant anew a climb up and down the same way! On August 29, after the cave gave out and when we had packed away our treasure, we started to look for new places. I entered several observations in my note-book. It was 5 P.M. when we thanked the Creator and left the empty find for home.

September 4. **Val Giuf.** First rock ledge. I worked at the Milarite-band. The pointed chisels became dull in no time in the hard rock. Noon came and no specimens yet. Without dynamite no Milarite! A stone shot down from the high cliff above and cut a hole, as large as a walnut, in my hat. Luckily the hat was not on my head at the time of the accident! After lunch I went to see the iced cave I had noticed a few days earlier. The cavity was accessible now and yielded several good specimens, some crystals were broken however.

September 9. **Val Nalps.** Nutta nera (black rock ledge) I did not forget the find of June 25. The 5 hour climb was very strenuous. I reached the cave at 9 A.M. My note book read: investigate 60 feet above first find. I went there and soon realized that I had easy sailing, the pocket lay open in 30 minutes. Prehnite and Albite became visible. The removal was troublesome, however. The specimens were nice and clean, but they could have been larger. Tourmaline and Stilbite were present in traces only. I started for home at 4 P.M.

September 11. **Mittelplatten.** Near the small lakes. I reached the mineral place at 8 A.M. Heavy clouds hung around Piz Ner; it started to rain, and even to snow. No shelter near or far. The cliffs became blanketed with a white covering. I recorded the place in my notebook and left for home.

September 14. **Val Giuf.** To the left of the first cliff. The cavity, mentioned Sept. 4th. was not emptied yet, but snow started to fall as soon as I reached the place. The pocket was about one foot high and gave no shelter from the weather. Hurriedly I packed a few specimens, while the west wind whistled though all gaps in the mountain chain. It became 11 A.M. and it was still snowing, by that time even far down into the valley.. The descent in the new soft snow became dangerous and strenuous. I reached the herders' cabins by 2 P.M. and was welcome during their delayed lunch hour. My feet were soaked to the bones.

September 16. **Val Cavradi.** In the upper part of Cugn Graischel (meaning narrow wedge). The visibility was good. I could see the cliffs of Val Giuf when I reached the elevation called Cugn Graischel and I recalled the abrupt ending of this year's prospecting up near Piz Giuf. Too early! But let's forget and start a search here. From below, hidden in the Alnus growth, a mountain chamois looked me over. It might know me from earlier visits. I started to shovel at the foot of the cliff, near a large white pine. The roots of the tree and the Alnus twigs bothered me. The sun rarely ever came out, but it was still fair. I had opened a 5 feet deep trench when I noticed a slight inwardly bend in the rock formation. I searched for the lower part of the vein and followed it with pick and shovel. Finally I reached an opening which proved to be an emptied cave! This happened to me before, several times already. Someone else before me had been the lucky one. I followed the vein to the right and ran across a Hematite (Eisenglanz) group in the dump pile. The specimen was nice and I appraised its worth at $12.00. A new pocket could not be found in this vein however. I left hurriedly to avoid the rain.

September 23. **Val Cavradi.** A nice morning again, after the long period of rain. I intended to try my luck at Preit Aulta (meaning high cliff). To the right of it a wall had become loose, years ago, water had entered the cracks and the freezing and melting gradually had moved the cleavage off the cliff-wall. I surveyed the situation calmly. Then with the crow-bar I removed the decomposed stones toward which the wall was lean-

ing and gradually the unsupported part went down into the gorge below; thus a fresh face appeared. The new vein was nice, vertical and signs of a pocket were at hand. Two hours work and the cavity was open. It yielded a small but pretty Hematite and several Adularia. New snow was still visible on shady places; the earth was frozen in sections. I then worked unsuccessfully on a rock above the herders' cabin. Only a couple of crystals were obtainable. No marmot whistle any more and no blooming flowers either, everything was hibernating already. New snow covered the mountain peaks. With a last look, all around, to take in the marvels of the beautiful mountains once more, I called: Adio, until we meet again! ... ...

SUMMARY: The year 1936 all in all was a good one for the prospector even though in high places the snow had not retreated as far as in earlier years. The month of September was rainy and the new snow set in rather early. The search for minerals and their removal has ended for the year. Time is now at hand for the worries to dispose of the crop.

A "Strahler", an assistant of Mr. Hitz, makes a brief pause in the Swiss Alps on the way up to a locality. Note the snow around the "Strahler". Photo taken in July, 1937.

SOME NOTES ON OPTICAL QUARTZ

One of the largest and finest quartz crystals ever to enter the United States went recently into the vaults of the Bausch & Lomb Optical Co., at Rochester, N. Y. Coming from the Province of Minas Geraes in Brazil, where it was brought by mule pack from the diamond section of the Serra da Mantiqueira range, 1,500 miles from the coast, the huge crystal weighs sixty-three pounds and cost $18.00 per pound. Based on optical quality, experts believe that it surpasses any museum piece of this type in the country.

Although quartz, a form of silica occurring in hexagonal crystals, is distributed throughout the world, no deposits of suitable optical quality have been found in the United States. Brazil is the chief source of supply and Bausch & Lomb is the chief purchaser.

The crystal is solid matter in its most perfectly developed and naturally organized condition. Its exterior is characterized by a form of extraordinarily regular geometrical design. The internal structure is, likewise, so regular that the arrangement of the structural units, or chemical molecules, is precisely the same about one point as every other point.

"If the growth of the crystal has been slow, undisturbed, and unrestricted in all directions," says Fred C. Brueck, who has studied optical minerals for 25 years, "its external shape is that of a closed solid, the surface of which is entirely made up of numerous plane facets, or 'faces,' meeting in straight edges, brilliantly smooth, as if highly polished. The arrangement of these facets, measured by their mutual inclinations, is characteristic of each crystal. Frequently," says Brueck, "the facets are not only truly plane, but as highly polished as though done by a jeweler's lapidary."

Light is reflected and refracted through the crystal. Viewed in sunlight or bright artificial light, the scintillation of spectrum-colored rays shows the beautiful properties of transparent crystal.

Quartz is a uniaxial crystal—one with two different directions of refractive index—and the interference colors may be brought about by the phase difference in various wavelengths of light. The crystal may absorb part of the components of white light, producing a definite color, which not only gives color to the mineral, but also modifies the tone of interference colors by removing from white light the components absorbed by the crystal.

Brazil supplied this large quartz crystal now in the tester's hands at Rochester, N. Y., where it will be turned into spectrograph prisms.

Since the phase difference between extraordinary and ordinary rays emerging from a uniaxial crystal depends on the length of path traversed—thickness of the quartz plate—and on the relative velocities of the two rays, and the relative velocities depend upon the character of the crystal and the direction in which the plate is cut from it, the interference color is related to the thickness of the plate. If the plate is not uniformly thick, it will show interference colors in different places.

"Crystals are frequently found," says Brueck, "which are obviously of a composite character, or composed of more than a single crystal of the same substance, in which there are two, or even three, parts belonging to separate crystals, although they are united in a definite and regular manner. Their twin nature is often betrayed by the presence of what are known as 're-entrant angles,' forming notches, arrowhead shapes, knee shapes and cruciform, or heart shapes. Frequently two or more individual crystals are so intimately blended that the appearance at first sight is that of a single individual crystal, a crystal of a higher degree of symmetry than a single crystal."

Brazilian crystals are characterized by a peculiar kind of interpenetration "twinning," Brueck explains, as he examines a slab of quartz under his polarizing microscope. "There are two different crystals in this one block. One piece has a right-handed movement like a clock, while the other has a left-handed movement, counter-clockwise. The interpenetration here is but partial and the twin has the appearance of a mirror-image, or reflection twin."

It is Brueck's job to determine the optical axis of the crystal before it is cut, to detect flaws, and to extract the greatest proportion of usable crystal from the material. To do this, he uses plane polarized light, vibrating in a straight line, or circularly polarized light which vibrates in a circle, because the character of the crystal is more easily detected than in ordinary light. Quartz crystals exhibit among other things, one set of concentric colored circles, with a dark maltese cross extending across the field.

Quartz crystals are used by Bausch & Lomb for lenses and prisms because of their high transparency and the superior resolution obtained with this material in the shorter wavelengths of light, such as the ultraviolet. The shorter the wavelength of light the greater the resolving power, disclosing more details in the structure under observation.

Although the microscope is now equipped with special ultraviolet accessories, it is in spectrographs, spectrometers, and monochromators that the chief necessity for quartz optics exists.

Biologists, cytologists and histologists benefit by the use of quartz accessories for the microscope because of the ability to differentiate better between various cell and tissue structures, while the spectroscopist utilizes quartz instruments in detecting various elements whose identifying lines lie in the ultraviolet portion of the spectrum.

Bibliography of the Geology and Mineral Resources of California for the years 1931 to 1936, inclusive: By Solon Shedd. During the past six years, contributions to the literature on the geology and mineral resources of California have been very substantial as is evidenced by the large number of entries in the Bibliography which is Bulletin No. 115. The bulletin is cloth bound, contains 125 pages and is issued by the State Division of Mines, Ferry Building, San Francisco, Calif.

World's Deepest Borehole

The New Central Witwatersrand Areas, Ltd., have recently anounced that their borehole on the farm Gerhardminnebron No. 4, in South Africa, had reached 10,718 feet (over two miles) in depth. This is the deepest cored hole yet drilled anywhere in the world.

The hole was sunk by a diamond drill in prospecting a gold property.

The Mining and Industrial Magazine of South Africa. May 20, 1938, p. 873.

COMMENTS ON THE GEOLOGY AND PHYSIOGRAPHY OF THE REGION ABOUT THE NORTHERN TIP OF THE NORTH AMERICAN CONTINENT

By P. G. DOWNES

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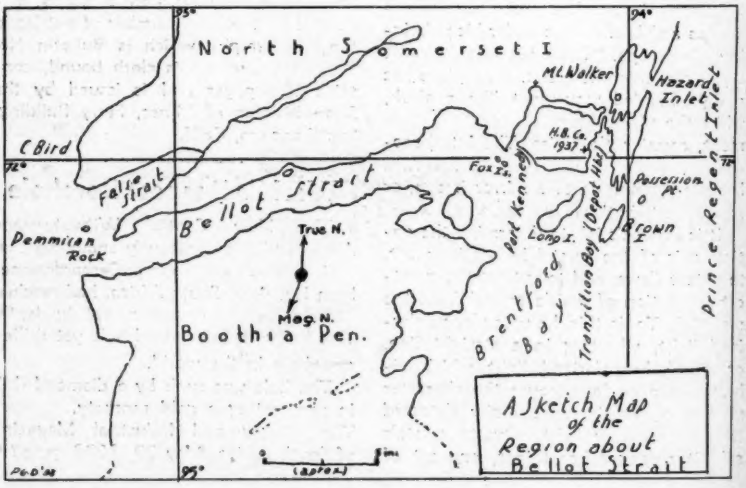
I suppose that it is a little too much to ask one to be interested in the geology and physiography of the region about the northenmost tip of the North American continent; a region several thousands of miles away and a spot unvisited by the white man since 1859. Nevertheless, it is just because of those very reasons I believe the matter is of interest.

The tip of Boothia Peninsula, that projecting thumb in the Canadian Arctic which plays host to the magnetic pole, represents the northenmost extension of the continent proper. Separated from it by a strait at one point, scarce a mile and one half wide, lies the huge island of North Somerset.

It was Sir John Ross who first visited this region in the years 1829-33. Eagerly searching for the northwest passage, the Cambro-Silurian cuestas and the Precambrian, rugged, masking islands deceived even this keen observer, and the strait which was to later prove a passage to the western sea was overlooked. He was followed a few years later by Kennedy and Lieutenant Bellot of this party, on a sledging trip, discovered the strait which bears his name.

In 1859, Captain M'Clintock, bent as so many others had been on discovering the final fate of the unfortunate Franklin, sailed his little vessel, the "Fox", down Prince Regent Inlet and anchored off the eastern entrance of the strait. He made five fruitless attempts to make the passage through to the western sea and at last was forced to winter here. His observations are limited in his narrative and the geological comment is rather meager. He was the last white man to visit the area described in this paper.

Then in the late summer of 1937, the Hudson's Bay Company steamer, the "Nascopie", pushed down through Prince Regent Inlet and on September 2nd



dropped her anchor in M'Clntock's "Depot Bay" at the eastern entrance of the strait.

Historically it was a thrilling moment. From a geological and physiographic point of view this region so meagerly described by M'Clintock, never photographed, was a bleak and cold paradise.

This extravagant statement arises from this fact. There at the entrance of Bellot Strait with Boothia to the south and Norfh Somerset to the north one finds the juncture of the ageless Precambrian granites and gneisses and the later Cambro-Silurian sediments, the two fundamental formations which compose the gigantic Canadian Arctic. Here before one's eyes were classical examples of cuestas of text-book purity. Here was cross-faulting beautiful to see. Here the vegetation was so scanty that the very "innards" of the ancient Precambrian shield were laid bare. Here were raised beaches, terraces and strand-lines to bring tears of joy to the most exacting physiographer.

Needless to say, the seven days which I spent here were those of feverish activity; collecting, photographing, drawing, clinometer and hammer, (the compass had simply gone dead). The mysterious flares we saw to the south, the arctic foxes as tame as dogs, the intermittent raging snowstorms were all ignored. I concentrated on getting over as much ground as possible.

From North Somerset, Boothia presents a panorama of glaciated, subdued

Precambrian hills. Vegetation, which at its best is but tundra grasses and mosses, lies in the valleys only. The effects of excessive glaciation are everywhere apparent. Glacial action has scooped deep reentrants of a fiord-like nature into the peninsula. Upon the part of Boothia which I saw, the Silurian sediments do not appear to actually encroach. They are known to do so farther south but here these are reserved for the outlying islands which present a vertical face to the west and slope gently into the sea on the east. Bellot Strait itself which separates Boothia from North Somerset would appear to be a fault running across the prevalent north-south strike. As seen from considerable elevation (909'), the structure of Boothia at this point seems almost identical to that of the point of observation, Mt. Walker on North Somerset. The contortion of the gneisses has sometime in ages past been tremendous. The bedding planes reveal in places an almost vertical dip and looking across to the other side of the strait the snow, oddly enough, brought out and emphasized the same condition.

Boothia itself presents an interesting phenomenon. For just as Bellot strait, running east and west, cuts across the strike, so do several transverse valleys, paralled faults, cross the peninsula. This parallel an cross-strike faulting continues on to Somerset for M'Clintock in his narrative speaks of a long narrow lake running parallel to the strait which they used in their winter sledge journeys to the west.

North of the northeastern extremity of Boothia, across the entrance of the strait, Brentford Bay, the cuestas formed by the tilted sediments form islands and continue north until at Depot Bay they join the igneous rocks of the Precambrian. The actual contact of these two distinct formations is not observed at this point for at this point of junction there is a long north-south valley covered with marine deposits which M'Clintock in his narra-

FIG. 1

View from summit of Mt. Walker, looking south. In immediate foreground is Mt. Walker. The tip of the U-shaped indentation is Kennedy Harbor, North Somerset Island extending southwards on both sides.

Bellot Strait, with huge cakes of ice floating in it, extends east and west. One of the Fox Islands is on extreme right.

Boothia Peninsula is in extreme background.

Photo taken on Sept. 7, 1937, last day on land, when the terrain was covered with snow.

tive called aptly enough "Transition Valley". The term valley is perhaps, speaking physiographically, incorrect for when the rugged, abrupt Precambrian ceases and the sediments begin one has, rather, a flat plain. This extends to the sea, terminating in a series of magnificent cuestas, abrupt on the landward side and dipping gently at an angle of fifteen degrees into the polar waters of Prince Regent Sound. In contrast to the grey and black of the forbidding Precambrian masses, these cuestas have a creamy yellow or buff color.

Those which I examined were limestone, though not fossiliferous. The difference in topography between the two so different geologcal areas is very striking. The Precambrian area is extremely rugged, and though heavily glaciated presents many shear faces due to faulting and the excessive action of frost. The relief is upward to seven hundred feet, while such rounded masses as Mt. Walker rise straight from the water's edge to over nine hundred feet. On top of this mountain, straiation was very marked and ran in an almost true east-west direction. The whole area has been maturely peneplaned.

Leaving the Precambrian area one immediately descends to the low flat plain afforded by the underlying sediments. This is but a few feet above sea level and only the barrier cuestas prevent marine encroachment to the rugged gneissic uplands, as is the case across the strait on Boothia.

An examination of the cuestas which appear to be from thirty to sixty feet high finds them of dense buff and cream-colored limestone. Below this appeared fleetingly a grey shale and some evidence of an interformational shale-sandstone series, some of it very striking in appearance. The vertical faces of the cuestas are very fractured and covered with talus due to the terrific frost action, a typical arctic occurrence.

The postglacial uplift of the land is everywhere evident from the perfectly preserved marine terraces. These in this area do not appear as high as is the case in some other parts of the arctic which I have visited within the past two years. Nevertheless, pleistocene shells were

FIG. 2

View looking east from Depot Bay.
A cuesta is in extreme background, on the right.

FIG. 3

A fine exposure of contorted gneisses on North Somerset Island, just east of Mt. Walker. The strike is true north and south; the dip is to the east.

The rocks are grey in color and very weathered, in some places they are rather rusty from their iron content.

The strike and dip are typical of the Pre-Cambrian area of the locality though this is an outstanding example.

abundant well above the two hundred foot level.

On September eighth we slowly and cautiously steamed away from this barren yet in a way magnificent, remote corner of the world. The night before, there had been a heavy snowstorm. Already the brooks and ponds had frozen over. The sea washed angrily against the smooth limestone foreshore while the black and forbidding Precambrian background rolled on and blended with the dark, low-hanging clouds; a bitter, tough land of rock, defiant and stern, just as it ever had been since time began.

Downes To Visit The Far North Again

P. G. Downes of Belmont, Mass., has recently left for the arctic regions of Canada. This will be his 5th summer up among the polar bears and Eskimos and he plans to be somewhere in the Mackenzie Basin or probably around Great Bear Lake.

During the past four summers he has traversed the arctic wilds from Labrador to Ellesmere Land examining the geological and physiographical formations. An interesting area visited was Boothia Peninsula, the home of the magnetic pole.

Mr. Downes is a member of the Rocks and Minerals Association and we may have another article from him on his return.

NOTES ON MINERALS FOUND IN AND ABOUT THE CORNWALL MINE, PA.

By DR. TITUS ULKE

On Nov. 14, 1937, the writer motored from Washington, D.C., with a party of mineral-hunting Adventist friends to Cornwall, Pa., to visit its celebrated iron mine, and to see what minerals we could find on the dumps about the open pit there.

En route we stopped at a large quarry on the Bel-Air Road between Baltiomre and Towson, Md., and collected some fine specimens of hornblende for our U. S. National Museum. The hornblende was found there in abundance, in coarse crystal aggregates in Baltimore biotite-gneiss, and also in thin flat plates in quartzitic lenses scattered through the gneiss.

Arriving in Cornwall, we first visited what is claimed to be the oldest charcoal-burning iron furnace in America, with its water-wheel (later steam) driven bellows and massive red sandstone walls, and which was used in casting pigs for cannon for General George Washington.

As stated in Guidebook 10 of the XVI Intern. Geol. Congress, the Cornwall mine is the only large iron ore mine at present operating in Pennsylvania. Mining began at Cornwall in 1740 and has been continuous ever since. The ore is chiefly magnetite, but carries at least 25 associated minerals of which the most common are hematite, iron pyrite, chalcopyrite, calcite and serpentine.

The ore body occurs as a replacement of Upper Cambrian limestone adjacent to an intrusive mass of diabase and was probably formed at the time the diabase was intruded. It is mined partly by open cut methods and partly by underground stoping. The ore is said to carry from 40 to 65 per cent of metallic iron, and from traces to nearly 2 per cent in copper, together with minute quantities of gold and silver. Thus far over 40 millions of tons of magnetite have been taken out.

Most of the magnetite observed was either coarsely granular or in loose grains, and strongly magnetic. Some of the hematite associated with the magnetite in the altered limestone appears in smooth, black, shiny, foliated plates, while other samples of the specular iron is micaceous in habit.

Iron pyrite commonly occurs at Cornwall in bright, striated, cubical crystals, up to nearly an inch on a side, in beautiful mirror surfaced pyritohedrons (pentagonal dodecahedrons) or in combinations of these forms, and but rarely show octahedral facets. Most of the pyrite crystals are loosely imbedded in a grayish calcareous matrix, associated with chalcopyrite and magnetite.

Chalcopyrite was found in granular or massive form and often exhibited a beautiful red, green or purple tarnish.

On the edge of the very large open pit opposite Cornwall Mine No. 3, the writer noted a boulder carrying dark reddish-brown crystals of garnet, up to 1½ inches long, and enclosing minute crystals of pyrite, which garnets were scattered through a light greenish-gray, fine-grained marble, evidently metamorphosed Conococheague limestone. The boulder probably originated near the contact of the limestone with the iron-bearing intrusive diabase, and the garnets therein represent a secondary alteration product.

Finally the dump yielded many pieces of serpentine, oil green to yellowish in color, some calcite in flat rhombohedrons, satiny white asbestos, and lastly some zeolites incrusting cavities in the diabase and exhibiting small, tabular white or greenish-white crystals, which are probably apophyllite.

THE AMATEUR LAPIDARY

Amateur and professional lapidaries are cordially invited to submit contributions and so make this department of interest to all.

Beach Pebbles

A number of amateur lapidaries have made some very interesting cabochons from pebbles gathered along river, lake, or ocean beaches. It is most surprising at times to see the beautiful patterns that can be brought to light in common pebbles often gathered near one's home.

We once saw a collection of about 500 pebbles that had been gathered along the ocean beach of an eastern city. Each had been cut en cabochon. The array of colors, patterns and designs were amazing—no two seemed alike and all had a beautiful polish.

The majority of pebbles found are quartz such as agate, amethyst, basanite, chalcedony, chert, jasper, milky quartz, plasma, rock crystal, smoky quartz. Other minerals may include amphiboles, corundum, epidote, feldspars, garnets, obsidian, opals, pyroxenes, etc. Very often one or more of these various minerals are assorted with other minerals to produce nice contrasts in color, design, or both.

So if you want something different to cut and polish—try pebbles.

Caplan To Tour South America

Allan Caplan, a young mining geologist and mineralogist, who for the past few years was a dealer in minerals at Boulder and Golden, Colo., will leave shortly for South America. Being interested in mineral occurrences, ore deposits, mining methods, and explorations, he plans to visit all important areas in South America that are of special value to a mining geologist and mineralogist. He will of course collect extensively but all specimens will be of the finest or rarest types with a special effort to be made to acquire a representative series of the rough gems of Minas Geraes, Brazil. The "expedition" will last over a year.

Mineral dealers, universities and scientific institutions who may be interested in acquiring good mineral specimens from South America are advised to communicate with Mr. Caplan at once as he will leave Colorado by July 15th. His address is Box 42, Golden, Colo. His mineral business of course is being discontinued.

Mr. Caplan has made many valuable and interesting contributions to ROCKS and MINERALS of articles on mineral localities of Colorado and he assures us that if opportunity permits he will have more articles on some of the interesting localities visited on his South American trip.

Mr. Caplan is a member of the Rocks and Minerals Association and our best wishes are extended to him on his expedition. May his journey be a most enjoyable and a profitable one and may he be successful in discovering many minerals that are rare or new to science.

A GEOLOGICAL TOUR IN COLORADO

By C. H. CARLSON

Weekly geology tours, conducted by the geology department of Colorado College at Colorado Springs, Colo., and sponsored by the Junior Chamber of Commerce of that city, are proving very popular with visitors to the Pike's Peak region who thus can not only enjoy the beauty of the Rocky Mountains, but also learn something about the formation and age of these majestic hills.

The tours are held Thursday afternoons during the summer months. Dr. Don Gould, of the college geology department conducted the second tour of 1937 on July 29 of which party the writer was a member. The group met at the college campus where each member was given a mimeographed text sheet describing the geological history of the Pikes Peak region. About 30 persons in a dozen cars, made up the tour. On each windshield and rear windows of the cars were pasted stickers, printed in the college colors, calling attention to the tour. The principal purpose of the stickers was to enable drivers of the cars to keep from getting separated when divided by traffic signals while passing through the city. A check of the cars indicated that the majority of those attending were from different sections of Colorado, but cars bearing Kansas, Texas and Oklahoma tags were also present.

The first place visited on the tour was Red Rock canon, just west of Colorado Springs, which contained formations similar to those found in the famous Garden of the Gods. Here Dr. Gould told the group how the mountains were formed and how the Rocky Mountain uplift tilted the sedimentary rocks up on end, to form a dike that crosses the entire state of Colorado, from south to north.

Following the visit to Red Rock canon, the group drove to Bear Creek canon, which lies to the south of Red Rock canon. The party stopped and continued its studies of the Ute Pass fault which makes a break of some fifteen miles in the sedimentary dike. Railroad cuts were also visited where it was possible to see the various deposits of upended sandstone, shale and limestone, laid out in their respective geological ages as though in a huge book. Teachers and students from the plains country gathered specimens of the various sedimentary rocks that lie several hundred or thousands of feet below their homes.

The last place visited on the tour was a nearby fossil bed. Here the individual members of the party, armed with mineral hammers, spent a busy hour uncovering fossil specimens laid down some 19 million years ago. When it was time to leave, every member of the group sincerely regretted to see the interesting afternoon come to a close; they bid goodbye to Dr. Gould and then left for home.

Recent Finds of Interest

QUARTZ: Tiny doubly terminated crystals, almost milky in color, embedded in a grayish clay, heavily stained by limonite, have been found by F. A. Vest of Roswell, N. Mex. The occurrence of the crystals embedded in the clay remind one of the selenite crystals from Ellsworth, Ohio.

The Museum of Wonders

On the north edge of the city of Bend, Oregon, on U. S. 97, stands an attractive, stone building—the Museum of Wonders. Although the museum is only a year old, it is already known far and wide for its large stock of excellent collector's material of rocks, minerals, Indian relics, curios, etc. Iridescent obsidian (first discovered in Oregon by the proprietor), thunder eggs, rough and turned juniper wood, and Indian relics are the specialties of the museum.

Thousands of collectors and tourists have stopped at the museum and made purchases during the past twelve months and the number of visitors is increasing daily.

The genial proprietor, P. L. Forbes, who is well known to many of our readers personally and to others through his very interesting articles which have appeared in past issue of ROCKS and MINERALS, extends a very cordial invitation to all members of the Rocks and Minerals Association to call on him and inspect his stock when they are in his vicinity. He, too, is a member of the Association and has been for years.

WILLIAM J. WEBB

APRIL 21, 1853 - SEPT. 10, 1937

We have but lately been informed of the death of Mr. William J. Webb who passed away Sept. 10, 1937, at his home in Yonkers, N. Y. He had the distinction in being among the first 100 subscribers to ROCKS and MINERALS, having sent in his subscription on July 21, 1926, at least a month before the magazine made its first appearance, and he had kept up his subscription regularly ever since. A loyal friend of the magazine and association, an interested student of mineralogy, and a warm friend of many who knew him personally, his death has been the cause of much sorrow among his wide circle of friends.

His extensive collection of minerals is for sale and information regarding it may be obtained from his daughter, Mrs. Tohrn, 27 Mitchell Ave., Yonkers, N. Y.

. . BIBLIOGRAPHICAL NOTES . .

MINERALS OF CALIFORNIA

California, the Land of Sunshine and Flowers and MINERALS, once again springs a pleasant surprise (on mineral collectors) by the issuance of a revised edition of **Minerals of California.**

This new edition, just off the press, is Bulletin No. 113 (it supersedes Bull. No. 91), and was prepared by Dr. Adolf Pabst, Associate Professor of Mineralogy at the University of California. It is published by the State Division of Mines, Ferry Building, San Francisco, Calif., price $1.75 (338 pp., clothbound).

The bulletin lists over 400 mineral species, each being described briefly, its chemical content, crystal form, hardness, color, properties, and other important characteristics listed. The occurrence of each mineral is given by counties with oftentimes a footnote included referring the mineral or locality to some printed report. A four page glossary, a 22 page bibliography, and a 14 page list of publications of the Division of Mines are also included. On the very last page is a short paragraph stating that samples (limited to two at one time) of any mineral found in California may be sent to the Division of Mines for identification, and the same will be classified free of charge.

We heartily recommend **Minerals of California** to all our readers, as it is a very valuable source of reference. Even though you may not live in California, this book should be in your mineralogical library. Order you copy TODAY.

We wish some of our eastern states, as New York, New Jersey or Massachusetts would follow California's example by issuing bulletins on the minerals of their respective state. But all we can do is wish; we dare not hope.

—P. Z.

JEWELRY, GEM CUTTING AND METALCRAFT

"Jewelry, Gem Cutting and Metalcraft" is the title of a new book, just off the press, that has been especially prepared for amateurs and instructors in these three popular handicraft works. Mr. William T. Baxter is the author. The book discusses fully the most modern-methods of jewelry-making, metalcraft and gem stone cutting and setting, giving practical hints as to the best tools and materials to use, and including an extremely useful list of firms from which to secure the necessary materials. It describes in detail how to cast rings and how to cut and mount gems in jewelry. The book is well illustrated with many diagrams and photographs of both the completed work and work in progress.

Mr. Baxter is Instructor in Art Metal and Jewelry at the Woodrow Wilson High School, Washington, D.C. He has had a wide experience in his chosen field and has developed many processes for doing the work better, quicker or more neatly.

He is without doubt one of the best qualified persons in the country to write upon the subjects covered in his book.

Dr. H. C. Dake, Editor of THE MINERALOGIST, has contributed a chapter on the identification of gem stones and gem minerals.

Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N. Y., 224 pp., 128 ills., $2.50.

SHELLEY W. DENTON

JUNE 11, 1859 - APRIL 30, 1938

Shelley W. Denton, 79, naturalist, mineralogist, gem expert, collector and world-wide traveller, died at his home on Denton Road, Wellesley, Mass., Saturday evening, April 30, 1938, after a three day illness.

He was born June 11, 1859, in Middlefield, Ohio, the son of William Denton, a noted lecturer, and Elizabeth Foote Denton, a writer. The family moved to Wellesley in 1865, when he was a boy of six. His father bought a 13-acre farm where the Denton homestead still stands.

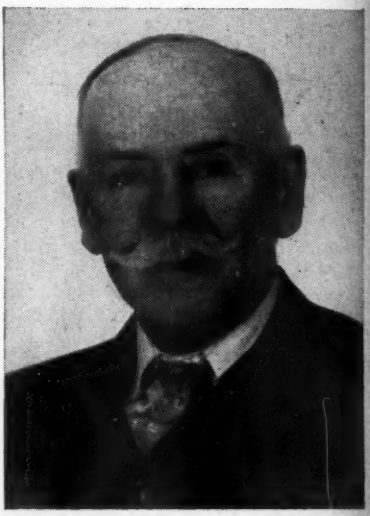
In 1878, he started with his father on a lecture tour of the United States, and in 1881 they went to Australia, New Zealand and New Guinea. It was in New Guinea that his father contracted jungle fever during an expedition into the interior and died.

Mr. Denton returned to Wellesley in 1883, and on his birthday in 1885 married Miss Ella Mae de Rochemont, also a resident of Wellesley.

He was for a time curator of birds in Mr. Brewster's private museum in Cambridge.

Together with his brother, Sherman, he become interested in the study and collection of butterflies. When Sherman invented the famed butterfly tablet, Mr. Denton took out the English patent and went to live and work in London for nine years. On the thirteenth birthday of the former Prince of Wales, now the Duke of Windsor, Mr. Denton supplied him with a complete collection of every butterfly and moth found in the British Isles. He also was asked to use his patented process to preserve the flowers taken from the coffin of Queen Victoria.

It was while in London that Mr. Denton became interested in gems and minerals, and upon his return to Wellesley, he turned his attention solely to them. Upon his retirement in 1923, he maintained a shop on Bromfield Street for the appraisal and exchange of precious stones.



SHELLEY W. DENTON

Throughout his life, Mr. Denton loved travel above all things. He had been all over the United States, had walked hundreds of miles in the search for minerals, gems, Indian relics. In the foreign countries, he penetrated far into the interior, beyond civilization to bring back specimens of minerals and wild life, and photographs of things he had seen. His collection of precious and semi-precious stones, of stamps and coins are remarkable in their extent.

He was a member of the Boston Mineral Club.

He is survived by his widow and his daughter, Miss Vanessa, by his sister, Miss Carrie Denton of Wellesley, and by a brother, R. Winsford Denton, of California.

THE TOWNSMAN, Wellesley, Mass.

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